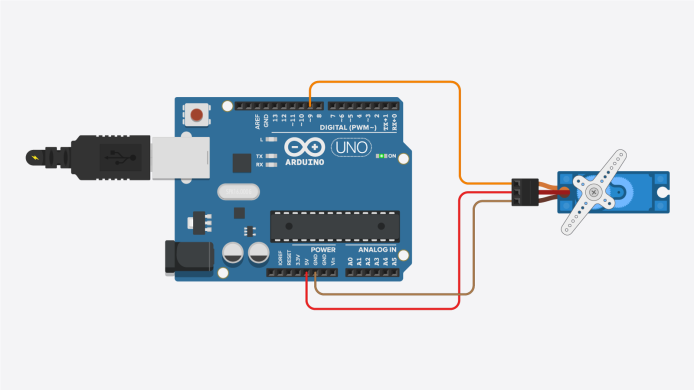
**WEEK - 05 PIR sensor data to control servo motor and LED’s:**

**PRELAB QUESTIONS - 05**

1. Draw the connection diagram to interconnect the components of servo motor

A:



1. List the application areas of servo motors.

Ans: **Robotics Precision**: Servo motors ensure precise movement in robotic arms and hands, allowing them to perform delicate tasks with accuracy.

**Manufacturing Precision**: They are integral to CNC machines, enabling precise carving and shaping of materials for manufacturing processes, such as making car parts or intricate designs.

**Industrial Automation**: Servo motors facilitate the smooth movement of products along assembly lines and assist in packing items into boxes with precision in factory settings.

**Aerospace Applications**: These motors control movements in aircraft and drones, aiding in flight control and stabilization for safe and accurate maneuvers.

**Automotive Functionality**: In automobiles, servo motors contribute to steering systems for smooth handling and assist in brake control, ensuring vehicles operate safely and effectively.

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1. Differentiate between servo motor and a DC motor.

Ans: **Servo Motor:**

- Utilizes a closed-loop control system for precise motion control.

- Offers high precision, accuracy, and controlled speed/torque.

- Incorporates feedback devices for real-time position, velocity, and/or torque information.

- Ideal for applications requiring exact positioning, such as robotics and CNC machines.

**DC Motor:**

- Typically operates in an open-loop system without feedback control.

- Provides high torque but may lack precision in speed control.

- Commonly used in simpler applications such as fans, pumps, and conveyors.

- Can be equipped with external sensors for specific feedback control if needed.

1. Classify different motors available?

Ans: Electric Motors: AC Motors, Induction Motors, Synchronous Motors, DC Motors, Brushed DC Motors, Brushless DC Motors

Hydraulic Motors, Pneumatic Motors, Brushed Motors, Brushless Motors, Stepper Motors, Servo Motors, Linear Motors

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Lab programs:

1. Program to control Servo motor in different directions:

Code:

Import RPi

Import RPi.GPIO as GPIO

Import time

GPIO.setmode(GPIO.BOARD)

GPIO.setup(22, GPIO.OUT)

pwm=GPIO.PWM(22,100)

pwm.start(5)

angle1=1

duty1=float(angle1)/10+2.5

angle2=160

duty2= float(angle2)/10+2.5

ck=0

while ck<=5:

pwm.ChangeDutyCycle(duty1)

time.sleep(0.8)

pwm.ChangeDutyCycle(duty2)

time.sleep(0.8)

ck=ck+1

time.sleep(1)

GPIO.cleanup()

OUTPUT:

